# LEPIDOPTERA FROM WESTERN PERU AND ECUADOR

By Wm. T. M. Forbes
Department of Entomology, Cornell University
Ithaca, New York

The occasion of this note is a little lot of Lepidoptera collected by Mr. and Mrs. D. L. Frizzell in the arid northwest corner of Peru, and Puna Id., Ecuador. While not many, the striking character of the fauna is indicated by the presence of two new Citheroniidæ, and the region evidently is worth intensive collecting. Among the normal and widespread things, may be mentioned *Cœa acheronta, Herse convolvuli* from the Pariñas Valley, near Negritos, Peru; *Pholus labruscæ, Celerio annei, Utetheisa ornatrix* from the Pariñas Valley; *Hymenia fascialis, Eudioptis hyalinata* and *Conchylodes arcifera* from the Quebrada Mogollon.

The following are worthy of more specific mention. A female Monarch shows the dull color and heavy black of the Lima females. Single females of *Ascia monuste* from Negritos, Peru, and Puna Id., Ecuador, suggest but hardly prove a racial difference.

**Lycæna ramon** Dognin. Pariñas Valley, May 7, 1939. This species was described from near Loja, Ecuador, a high temperate and semiarid locality in the heart of the Andes[1] but is equally at home at sea level, where I took it commonly at Lima. It also occurs on the western slope of the Andes at Chosica and Matucana, and we have a specimen from Eten, a little north of Lima—so it doubtless covers the whole arid area of western Ecuador and at least northern Peru. We received the Eten specimen as *hanno,* and other material may be floating around under that name, but it is easily recognized by the ocelli on the hind wing below—two larger between $M_3$ and $Cu_2$, and two only a little smaller behind $Cu_2$. The following key to the American species of *Lycæna,* subgenus *Hemiargus* will place it more precisely.

[1] Brown, Ann. Ent. Soc. Am., 34: 832.

1. Postmedial spots of fore wing below large and black, contrasting with the small and fuscous subterminal series ..... *isola*
–. Pm. spots of fore wing similar to subterminal ones ..... 2
2. Hind wing below with a large ocellus in cell $M_3$ (cell 3 of Herrich-Schaeffer system), similar to the one behind it ..... 3
–. Hind wing with no ocellus in cell $M_3$ ..... 5
3. Inner half of hind wing below contrastingly darkened, nearly obliterating the usual marks, which are much enlarged in this area; four small ocelli ..... *martha*
–. Hind wing with ground all one color, the fuscous spotting generally uniform ..... 4
4. Two ocelli in anal area (behind $Cu_2$) about two-thirds as large as the ones in front of it and similar ..... *ramon*
–. These ocelli small with a small silver spot only, or dull and similar to the anterior subterminal markings ..... *zachaeina*
5. Anal area with a single large ocellus, similar to the one in front of $Cu_2$ ... 6
–. Anal area with two subequal and inconspicuous spots or ocelli, about as in *zachaeina*, or none ..... 8
6. Gray-brown below with spots all small, subequal and grayish ... *bahamensis*
–. Pale gray below ..... 7
7. Hind wing below, and above in female, with a very broad white submarginal band; all spots below small and similar ..... *dominica*
–. Hind wing below with less conspicuous white submarginal band or none; three of the dark spots black and conspicuous ..... *ammon* (*catilina* auct.)
8. Largely gray above; hind wing with slight tail and anal lobe ..... *bornoi*
–. Mostly blue above; hind wing evenly rounded ..... *hanno* (*catilina*)

*Goniurus jethira* Butler. Easily recognized by the very large honey-yellow spots, which are even larger in this specimen than in the type. (Lep. Exot., p. 65, pl. 25, fig. 4). Pariñas Valley, May 7, 1939. The original locality was merely "Peru" but I did not take it either at Lima or in the Chanchamayo, and suspect it is a specialty of the arid Northwest.

**Arsenura harrietæ**, new species

Closely similar to *A. richardsoni* Druce in major features; the fuscous ground very lightly dotted with black, most definitely on posterior half of median area. Antemedial of two widely separated blackish lines, the inner nearly straight and outer much bowed out below cell, as in *richardsoni*, but with heavier blackish filling, and the lines themselves more contrasting; postmedial line much further out, nearer to subterminal than to discal lunule, blackish, more definite and more bowed out opposite lower angle of cell, the median area conspicuously whitish toward inner margin; the following line (subterminal in position, but probably morphologically the outer postmedian) black, defined outwardly by a clay colored line, which is much finer and more

contrasting than the defining pale shade in *richardsoni;* course much as in *richardsoni,* but closer to margin, especially on costal third, and not nearly as much extended toward base on inner margin; subterminal area not pale as in *richardsoni,* but as dark as ground on fore wing and contrastingly blackish on hind wing, with much paler yellow-brown terminal area. Subapical black spot shorter than in *richardsoni,* not distinctly defined with white; the terminal area below it vaguely shading between dull and red brown, without the contrasting red-brown wedges of *richardsoni.* Discal lunule black and contrasting with central tawny lunule, as in *richardsoni,* but without the tawny bar extending from its outer side.

Hind wing generally similar to fore wing, but with only a faint darker antemedial shade in place of the double line and dark filling, this shade incorporating the faint discal bar (which is more distinct in *richardsoni*); postmedial band as on fore wing, much more conspicuous than in *richardsoni;* the outer pattern differing from the fore wing as noted. Wing form rounder than in *richardsoni,* the apex of fore wing and angle of hind wing less extended. Under side much less mottled than *richardsoni,* with three wavy outer bands, varying from obsolescent to rather conspicuous, the outer strongest and middle one weakest. Body plain brown as in *richardsoni.*

Expanse 92–110 mm., much smaller than *richardsoni.*

Puna Id., Ecuador; type and two paratypes in collection Cornell University.

This may possibly be a race of *richardsoni,* but the discontinuous distribution, different wing form and many differences in pattern suggest rather a good species. The following skeleton key will place it in the genus:

1. Antemedial line double, of an outwardly oblique inner and a strongly excurved outer element, the latter sometimes faint; st. space on posterior half of fore wing and hind wing much broader than terminal area ..... 2
–. Am. line single, straight and outwardly oblique; both wings with a sharply defined even slender pale marginal stripe ..... **romulus*
–. Am. line single, outcurved or angled, inwardly oblique to inner margin; st. space narrower, usually much narrower than terminal space, except sometimes for narrow extensions ..... 4
2. Fore wing roundly falcate and deeply excavate below apex; hind wing with tooth large, 12 mm. long on anterior side; hind wing with inner st. line deeply sinuate, passing half way between margin and cell at $M_1$ ..... **championi*
–. Wings less irregular; st. line of hind wing crossing $M_1$ two-thirds way out to margin ..... 3
3. Discal spot of fore wing with a simple orange central lunule; margin of wings hardly irregular ..... **harrietae*

–. Discal spot of fore wing with a short extension of middle of outer side of lunule, forming a Greek *e;* tail of hind wing 6 mm. long. **richardsoni*

4. Hind wing at least with a series of dark spots or lunules in terminal area, wholly distinct from the subterminal complex; fore wing with black markings conspicuous in cells $M_1$ and almost always $M_2$, the upper usually joining to the apical pattern but conspicuous, the lower usually free ..... 5

–. Hind wing without this series of markings, though often with somewhat similar extensions of the st. area; black patches in cells $M_1$ and $M_2$ normally absent, sometimes mere dashes, or lost in general blackish shading ..... 11

5. Generally smaller species (female alcmene expanding 140 mm.), head solid black, contrasting with the paler brown or fuscous thorax ..... 6

–. Larger species (160 mm. and often more); head with at least a contrasting pale bar over bases of antennæ ..... 8

6. Postmedial line not defined with pale; st. area expanded into a large patch, occupying two-thirds the area between st. line and margin in cells $R_4$ and $R_5$ ..... *alcmene*

–. Pm. line conspicuously defined by a following dirty white shading; st. area below apex less extensive ..... 7

7. Markings of fore wing corresponding to the admarginal lunules of hind wing taking the form of two similar large blotches in cells $M_3$ and $Cu_1$ (feet not seen) ..... *pandora*

–. This element of pattern taking the form of a waved diffuse admarginal line; tarsi concolorous dark brown ..... **angulata*

–. This element obsolete, except at anal angle, where it is not conspicuous; tarsi cream white, contrasting ..... **xanthopus*

8. No black st. patch in cell $M_2$; pm. area of both wings heavily shaded with black; discal spot of fore wing lunulate; no admarginal spots on fore wing ..... *sylla, hercules*

–. Cell $M_2$ heavily marked subterminally with black; discal spot a simple bar ..... 9

9. No admarginal lunules on posterior part of fore wing; the black spot in $M_2$ fused with the blotch in cell $M_1$ ..... *aspasia*

–. Spot in cell $M_2$ separate, conspicuous, and followed with dark shades in cells $M_3$ and $Cu_1$ similar to those on hind wing ..... 10

10. Ground with strong yellowish tint; the two black patches in cells $M_1$ and $M_2$ similar, very large, separated by hardly more than the light vein, and scaled heavily with blue ..... **meander*

—. Ground with olive tint; the second black patch narrow and ovate. **biundulata*

11. Inner subterminal line nearly even, and marked with contrasting whitish dots on veins or more irregular whitish patches; antemedial line when distinct formed of a straight or concave bar across cell and a very oblique lower portion from lower side of cell to basal angle ..... 12

—. Inner st. line more irregular, normally with two large scallops between $M_3$ and $Cu_2$, with only limited and irregular white marks; am. line when distinct with lower portion less set off from portion crossing cell, frequently in the form of a single excurved band ..... 14

12. Lower segment of am. line conspicuous, in line with and more or less continuing the black shade subterminally across cell $M_1$; a conspicuous pale st. patch just below it in cell $M_2$ ..... *ponderosa*

—. Lower segment of am. line inconspicuous; no single pale st. patch ..... 13

13. Outer margin strongly irregular; postmedial area contrasting bright chestnut brown ..... *batesi*

—. Margins less irregular; ground rather even dull light brown. ..... **crenulata*

—. Margins still less irregular; pm. area somewhat contrasting, but light brown ..... *arcaei*

14. Discal spot lunulate, with contrasting pale center; dentations of inner and outer st. lines if present not closely corresponding ..... 15

—. Discal spots simple; the inner and outer st. lines closely parallel over the dentations at cells $M_3$ and $Cu_1$ ..... 16

15. Inner st. with distinct and outer with very strong dentations, the white accompanying shade irregular ..... **cymonia*

—. Inner st. line nearly straight, and with even accompanying white shade; outer st. obsolete ..... *thomsoni*

16. Outer st. line with very strong, narrow black-filled dentations on both wings, three or four of them on fore wing similar ..... *polyodonta*

—. Outer st. line closely fitted to inner, both without strong dentations, save for two in cells $M_3$ and $Cu_1$ of fore wing ..... group **armida*

—. Intermediate; the two upper teeth on fore wing present, but only half as large as the two lower, and filled not with special black triangles but with extensions of the generally blackish contrasting pm. area; very large, expanding 175 mm. ..... **archianassa*

In structural characters, the wing-form varies too widely in obviously closely related species to serve for major subdivision, but two groups are set apart by having pectinate antennæ, sylla and arcæi with their relatives—alternatives 5 and 12 of the key. The residue, so far as seen, and including *harrietæ*, have serrate and fasciculate antennæ.

*Dysdæmonia* species. There was badly broken material of a very striking undescribed Dysdæmonia, with scalloped wings. It will be described by Mr. Johnson, who has a better specimen from the same region.

* Species represented in coll. Cornell University, many of them the gift of Mr. Frank Johnson.

*Givira tristani* Schaus. A rubbed specimen from Puna Id. is this species or very close.

*Euclea copac* Schaus. Puna Id. Agrees so far as can be seen, but not good enough for certainty. The species was described merely from "Peru."

*Seirocastnia elaphebolia* Druce. Looks to me like a good species. Described from Ecuador.

**Monodes convexa,** new species

Superficially similar to the North American *festivoides* group, but with relatively much smaller body and arched fore wings. Structures of the normal Monodes, without sex-scaling; male antennæ ciliate, legs unmodified, with a rough tuft beyond middle of mid tibiæ; vestiture normal for Monodes, as described by Hampson, but with the posterior thoracic tuft extended back, almost completely covering the basal abdominal tuft, and roundly truncate behind. Palpi with second joint upturned only a little beyond middle of front, as also in normal species of Monodes.

Body fuscous, thorax somewhat mottled, with darker lower half of collar, the upper half of front, vertex and lower half of collar contrasting blackish in dark specimens; palpi with first and second joints with paler apices, the outer sides contrasting blackish in dark specimens. Fore wing gray, varying extremely in tint, light specimens with the terminal third much darker, dark ones sometimes with the costal area rather darker. Costa with numerous dark bars in light specimens, dark, cut with the pale gray ante- and postmedial lines in dark specimens, and with about four small whitish bars between postmedial and the pale apical shade. Subbasal line of vague paler powdery scaling, toward costa, toward inner margin represented by an oblique blackish bar; antemedial obscure, except for the contrasting pale bar at costa; postmedial represented by dark spots on veins, followed by minute whitish ones, broadly and evenly excurved on costal two thirds, then oblique in to inner margin and slightly concave. Subterminal obscure, sometimes indicated as the irregular boundary between a grayer terminal and browner subterminal area; orbicular and reniform spots large, the orbicular outlined with black except above, usually heavily before and behind; reniform very large, only partly outlined; the area before orb. blackish, the filling between orb. and ren. blackish or shaded with dark, without the sharp boundaries of the festivoides group, the space between ren. and postmedial line usually somewhat darkened, but without a blackish spot. Claviform minute, whitish, usually contrasting, heavily outlined with black, especially before and beyond. Apical oblique shade varying from obsolete to conspicuous, cream white to ash gray, with the basal half shaded with buff in light specimens and slightly warmer brown in dark ones; starting from pm. line opposite cell, curving up and widening in a horn shape, and ending on outer tenth of costa; partly edged behind with black. Terminal blackish dots, obscure in dark speci-

mens, preceded by whitish points, alternating with the pm. ones. Fringe powdery gray, the outer half rather smoother and less powdery. Hind wing dirty white, shading into fuscous on outer half; alula cream, clothed with large scales and conspicuous. Expanse 17–20 mm.

This species in normal specimens will run in Hampson's key to the *festivoides* group, from which it is distinguished by the total lack of warm coloring, much smaller body and arched fore wings, also in maculate forms by the less sharply defined blackish about the orbicular and reniform. It is probably close to *bogotana* Felder and *aphaidropa* Dyar (which are presumably merely color forms of each other) but is smaller, and none of our series are as pale as Felder's figure of *bogotana,* nor show the reddish shadings along costa of *aphaidropa.* It varies enormously, from specimens (males) with the basal two thirds luteous and only the outer third blackish, much like Felder's figure, to specimens (females) that are wholly suffused with smoky gray and coal black, with all the markings obsolescent. Such specimens will probably key out to *phœopera,* but differ from it and its relatives by the rather even dull gray, with the darker area between orbicular and reniform, and the paler apical area at least faintly visible.

The male genitalia of Monodes are extremely varied, and convexa resembles *nucicolora, grata* or *fusimacula* more closely than *festivoides,* having the valves slender, with a complicated basal chitinization composed of parts of sacculus, costa, and perhaps clasper, and sending a spike forward across the costa; weak clasper at a third way out, crossing costa; juxta slenderly extended as a complete anellus, and transtilla also bent into a round arch closely parallel to it. Ædœagus with two massive spines, formed of fused cornuti.

Holotype, male from Chosica, Peru, May 25, 1920. Numerous paratypes of both sexes, from Chosica and Lima, Peru, May 1920; a couple caught by Parish at Lima in 1915; and a pair from the Amotape Mts., N.W. Peru, collected by the Frizzells; all in collection Cornell University. I believe other specimens exist in collections, perhaps labelled bogotana, but the Lima fauna has been extraordinarily neglected, considering how many good collectors have passed through it or even used it for a base.

*Cydosia phædra* Druce. Puna Id.

*Cobubatha numa* Druce. Amotape Mts.

**Dichochroma,** new genus

Similar to the Pyraustine genus Dichogama. Vestiture of large, smooth scaling; palpi upturned to middle of front, close-scaled, slightly flattened against the front; the segments well marked off, third segment larger than in Dichogama, two-thirds as long as second, continuing the direction of second; maxillary palpi rough-scaled, flattened against the face, as in Dichogama. Tongue strong. Legs very short for a Pyraustine, as in Dichogama, mid tibia about as long as femur without trochanter, and tarsus hardly longer. Fore wing presumably with the long Arctiid-like frenulum hook of Dichogama (male not seen); $R_3$ and $R_4$ stalked, $R_5$ stalked with $M_1$, well separated from $R_4$, $M_2$ and $M_3$ stalked, $Cu_1$ parallel to $M_3$, arising well before end of cell. Hind wing without fringe on Cu; $M_2$ and $_3$ strongly stalked, as in *D. fernaldi,* but unlike the other Dichogamas at hand.

Third A of fore wing is strong and makes a wide loop, but I cannot see if it runs back into 2d A.

This genus is clearly a development of Dichogama, differing from it, and from all Pyraustinæ known to me in the stalked $R_5$ and $M_1$ (veins 6 and 7) and from most in the stalking of $M_2$ and $M_3$ in both wings. It is also far smaller than any Dichogama yet known, and is found on the Mainland, while Dichogama is essentially Antillean, only *D. diffusalis* not yet being known from the Antilles. In Hampson's key (Proc. Zool. Soc., 1898, 594) it will run to Hymenia or Macarætera, according to how the third segment of the palpus is interpreted, but has no real kinship to either. The stalked veins will easily separate it.

By the way there is no reason for marking several species of Dichogama "incertæ sedis" as Klima does in Lep. Cat. 89, p. 122. We have *colotha, fernaldi* and *gudmanni* from Porto Rico and they are normal Dichogamas, save for the stalked instead of approximate $M_2$ and $M_3$ in *fernaldi;* and *amabilis* and *bergii* show patterns that would hardly occur elsewhere; but *smithii,* unquestioned by Klima, is the well known Noctuid, *Casandria abseuzalis,* which I found common in Porto Rico.

**Dichochroma muralis,** new species

Head and thorax mouse gray, dusted with whitish scale-tips; thorax immaculate; shaft of antennæ blackish; palpi with first segment whitish, second mouse gray, but whitish along the ventral inner keel; third segment blackish with contrasting dirty white tip. Under side cream white, the front side of the fore legs fuscous. Abdomen above mouse gray, immaculate, below nearly white.

Fore wing mouse gray, immaculate but with pale scale-tips especially toward base, and sparsely overlaid with narrow whitish strap-shaped scales; fringe whitish. Hind wing translucent white with narrow and broken fuscous terminal line. Expanse 16 mm.

Amotape Mts., N. W. Peru, H. & D. L. Frizzell; type one female in coll. Cornell University.

In sum this little fauna from the north end of the arid coastal strip of South America is a curious one. While the typical material of this strip is present (*e.g., Celerio annei* and *Monodes convexa*) there is also a definite Central American element (notably the Arsenura, which is closest to *A. richardsoni*), and a few species which now appear to be endemic, such as the undescribed Dysdæmonia, *Euclea copac* and *Dichochroma murina.* Plainly many more interesting things are due to come out of the area.